

## **Abstract**

An improved ventilator which delivers ventilatory support that is synchronized with the phase of the patient's respiratory efforts and guarantees a targeted minimum ventilation. Improved synchronization is achieved through an instantaneous respiratory phase determination process based upon measured respiratory airflow as well as measured respiratory effort using an effort sensor accessory, preferably a suprasternal notch sensor. The ventilator processes a respiratory airflow signal, a respiratory effort signal and their respective rates of change to determine a phase using standard fuzzy logic methods. A calculated pressure amplitude is adjusted based upon the calculated phase and a smooth pressure waveform template to deliver synchronized ventilation.